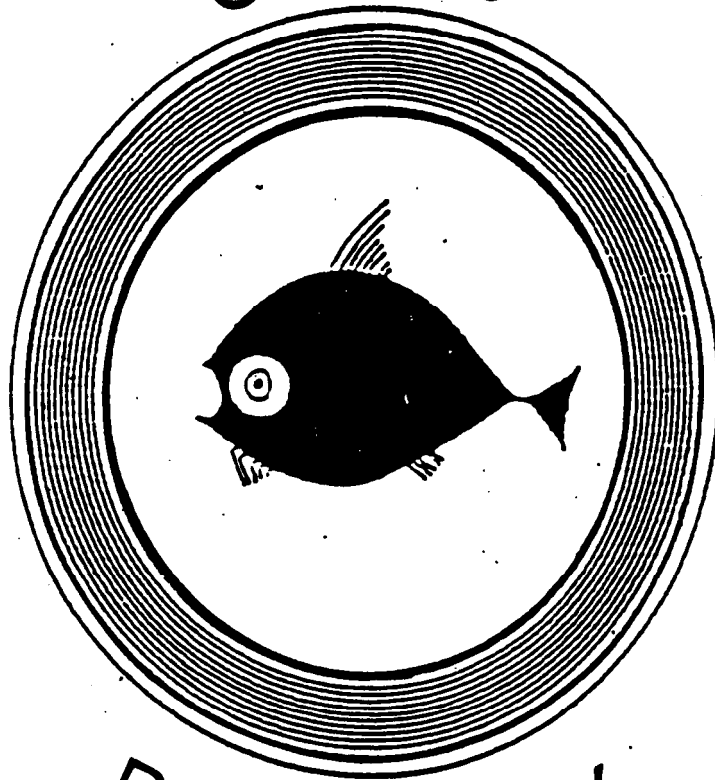


CHIHUAHUA
CHUB



RECOVERY
PLAN



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RECOVERY PLAN

FOR

CHIHUAHUA CHUB

Gila nigrescens (Girard 1856)

Prepared by

U.S. Fish and Wildlife Service

Office of Endangered Species, Region 2

Albuquerque, New Mexico

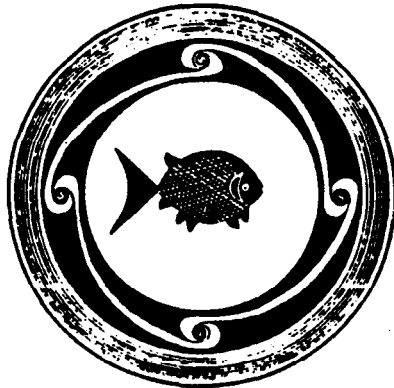
Approved:

By:

Michael J. Pearson
Regional Director
U.S. Fish and Wildlife Service
Region 2

Date

4/14/86



DISCLAIMER

This is the completed Chihuahua Chub Recovery Plan. It has been approved **by** the U.S. Fish and Wildlife Service. It does not necessarily represent official positions or approvals of cooperating agencies (**and it** does not necessarily represent the views of all **recovery** team members/individuals), who played the key role in preparing the plan. This plan is subject to modification as dictated by new findings and changes in species status and completion of tasks described in the plan. Goals and objectives will be attained and funds will be expended contingent upon appropriations, priorities, and other budgetary constraints.

Literature citation should read:.

U.S. Fish and Wildlife Service. 1986. Chihuahua Chub Recovery Plan. Prepared by the USFWS, Region 2, Albuquerque, New **Mexico**.

Additional copies may be purchased from:

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ACKNOWLEDGMENTS

This **recovery** plaa is based upon a management plan **written** by Michael **D. Hatch** and John P. Hubbard, Biologists, Endangered Species Project, New Mexico Department of Game and Fish. The management plan entitled Management Plan for the Chihuahua Chub, *Gila nigrescens* (Girard, 1856) in New Mexico was completed **January** 25, 1980, and was **written in the** basic format of a recovery plan. The U.S. Fish and Wildlife Service is appreciative of the fine effort of Hr. Hatch and Dr. Hubbard in preparing the management plan upon which this recovery plan is based.

Fish designs found on the cover and throughout the Plan come **from** prehistoric **Mimbres** Indian pottery. The **Mimbres** Indians occupied the **Mimbres** River Valley **from** AD200 until around AD1150 and co-existed with the Chihuahua chub. Why designs of fish were so often **used** on **Mimbres** Indian burial bowls **is** not known. Of those bowls depicting animals, approximately one-third display fish.



SUMMARY

1. GOAL

To remove the Chihuahua chub from the Federal list of Endangered and Threatened species by restoring them as a secure, stable and self-sustaining species within the Mimbres River of New Mexico.

2. RECOVERY CRITERIA

Delisting of the Chihuahua chub will be considered when (1) conservation easements or other legal agreements have been obtained on the spring-fed tributary where the fish presently exist, and (2) two additional secure populations are successfully established within its former range on the Mimbres River.

3. ACTION NEEDED

Steps needed to meet recovery criteria include:

1. Provide habitat protection on areas where the Chihuahua chub presently exists **or** where suitable habitat **can be** reclaimed.
2. Reclaim **two** habitats where Chihuahua chub can be reintroduced.
3. Reintroduce Chihuahua chub into reclaimed habitats and monitor those populations to determine success **of** the reintroduction.

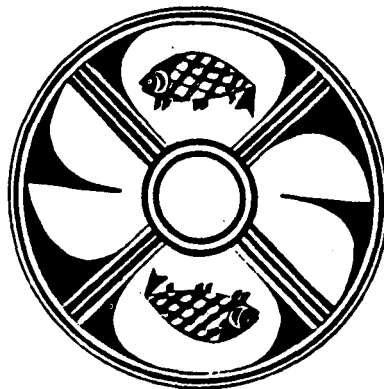
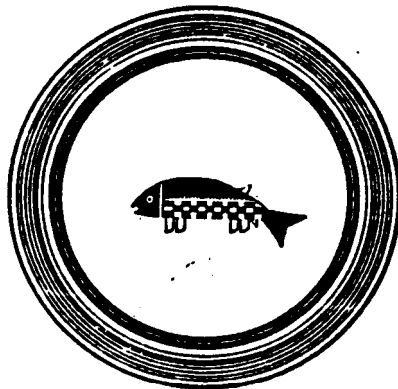


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PART I

INTRODUCTION

The genus **Gila** comprises a group of minnows, commonly called chubs, that are generally restricted to western drainages of North America, especially within the Colorado River Basin. Many of the chubs in the genus are restricted in their distribution or are otherwise vulnerable in terms of their survival.' Presently 18 species or subspecies are considered endangered, threatened, or are of special concern (Deacon et al. 1979). The Chihuahu-chub (**Gila nigrescens**) is a restricted species that is listed as threatened at the Federal level and is treated as endangered by the State of New Mexico (**N.M.D.G. & F.** Reg. No. 599). This recovery plan provides a systematic means to recover the Chihuahua chub in its United States range (New Mexico). The plan may also prove useful in helping preserve this species in Mexico (Chihuahua), where the major portion of its range exists and where it has also declined (Miller and Chernoff 1979).

Nomenclature

The Chihuahua chub was originally described from the Mimbres River (Luna or Grant County), New Mexico, by Baird and Girard (1854) and assigned the name **Gila pulchella**. Subsequent names applied to the species include: **Tigoma nigrescens** Girard, 1856; and **Tigoma nigrescens** Jordan and Evermann, 1896.

Due to taxonomic revision of the genus Gila, a conflict with homonyms developed, and the present name Gila nigrescens was adopted, with the Rio **Janos** at **Boca** Grande, Chihuahua, Mexico, recognized **as** the type locality. While the name Gila nigrescens has also been applied by various authors (e.g. Jordan 1891; **Koster** 1957) to the chub that resides in the Rio Grande and **Pecos** drainages, **that** species (the Rio Grande chub, Gilapandora) **is** quite distinct and should not be confused-with the true G. nigrescens of the **Guzman** drainage.

General Description

The Chihuahua chub averages 5-6 inches in length at maturity and may reach 12 inches. **The origin** of the dorsal fin is behind that of the pelvic fin (as is typical in Gila) and the dorsal fin ray count **is** usually 9. There **are** usually **67-78 scales** in the lateral line. Coloration is dusky brown above and whitish below. During the breeding season an orange-red color develops around the **mouth** and lower fins, and on more colorful individuals this also occurs on the pelvic and pectoral fins and lower sides' of the head and body. Post-larval G. nigrescens are characterized by a spot above the lateral line, immediately preceding the **caudal fin**:

Distribution and Status

The Chihuahua chub is endemic to the Guzman Basin, where **it** occurs from the Mimbres River in New Mexico (Fig. 1), southward to northwestern Chihuahua, Mexico (Fig. 2).

The chub was first collected in 1851 from the Rio Mimbres by a member of the United States and Mexican Boundary Survey (Baird and Girard 1854). Following that, the species was not observed in the Mimbres again until June **5**, 1975, when Bill Rogers (1975) discovered approximately 20 chubs and collected two "1/4 mile upstream of Bear Canyon Reservoir", Grant County, New Mexico (Fig. 1). Within the Mimbres drainage, the chub is **presently** confined to a **reach** of river extending from **Allie** Canyon downstream **to** a point opposite the Mimbres **Post** Office and a small, privately owned, springfed tributary located on the east side of the Mimbres River, opposite Bear Canyon Reservoir. This relict population represents the species' only natural occurrence in the United States. The species is presently found only on private lands.

In Chihuahua, the species was formerly known from at least 15 different localities. However, during a 1979 survey in which these localities were revisited, only 7 (Fig. 2) were found to be **occupied** by the chub and only 3 had "healthy" populations (Miller and Chernoff 1979).

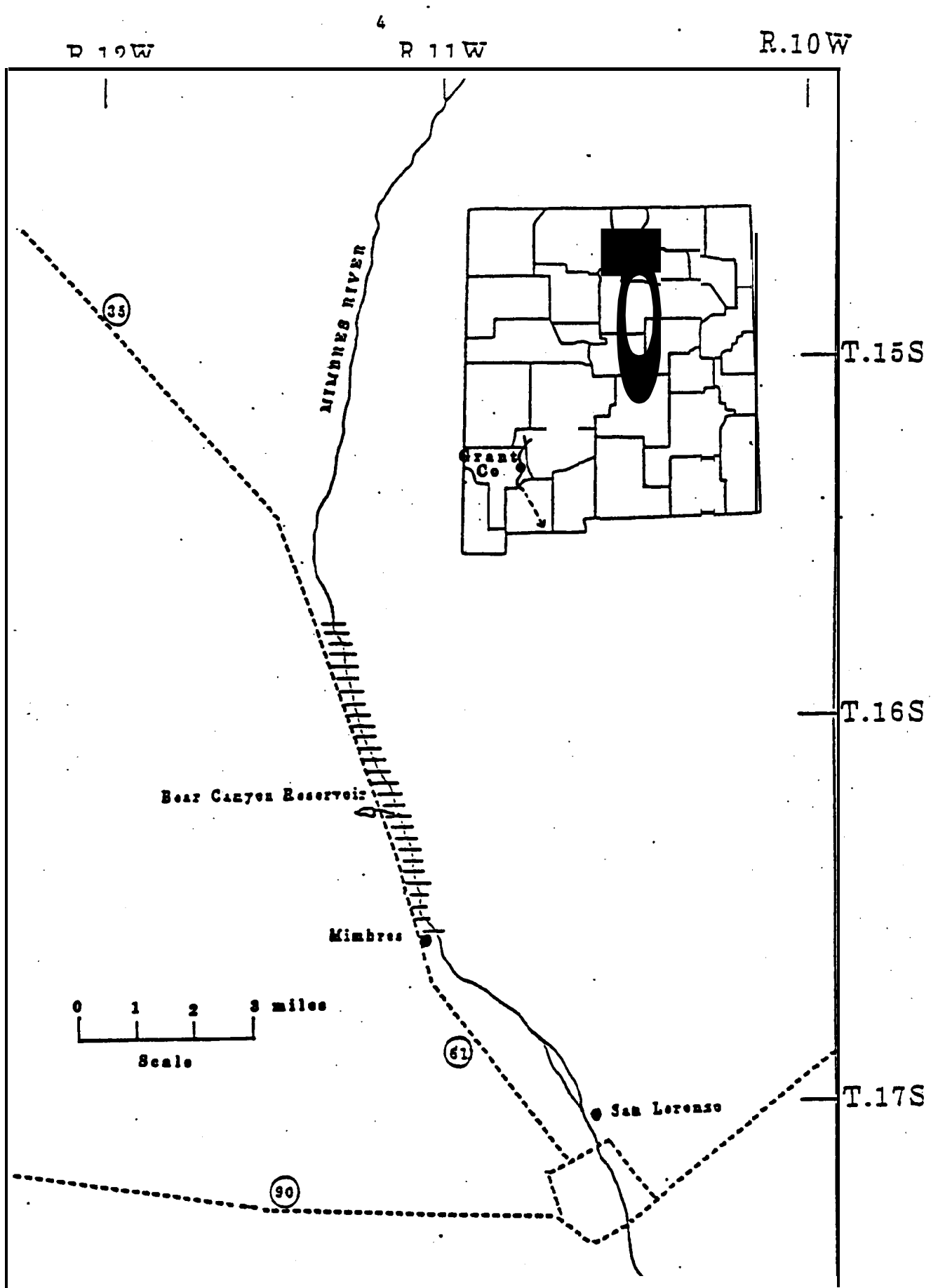



Figure 1 - Present distribution of the Chihuahua chub in the Mimbres River, New Mexico,  represents approximate location of Chihuahua chub.

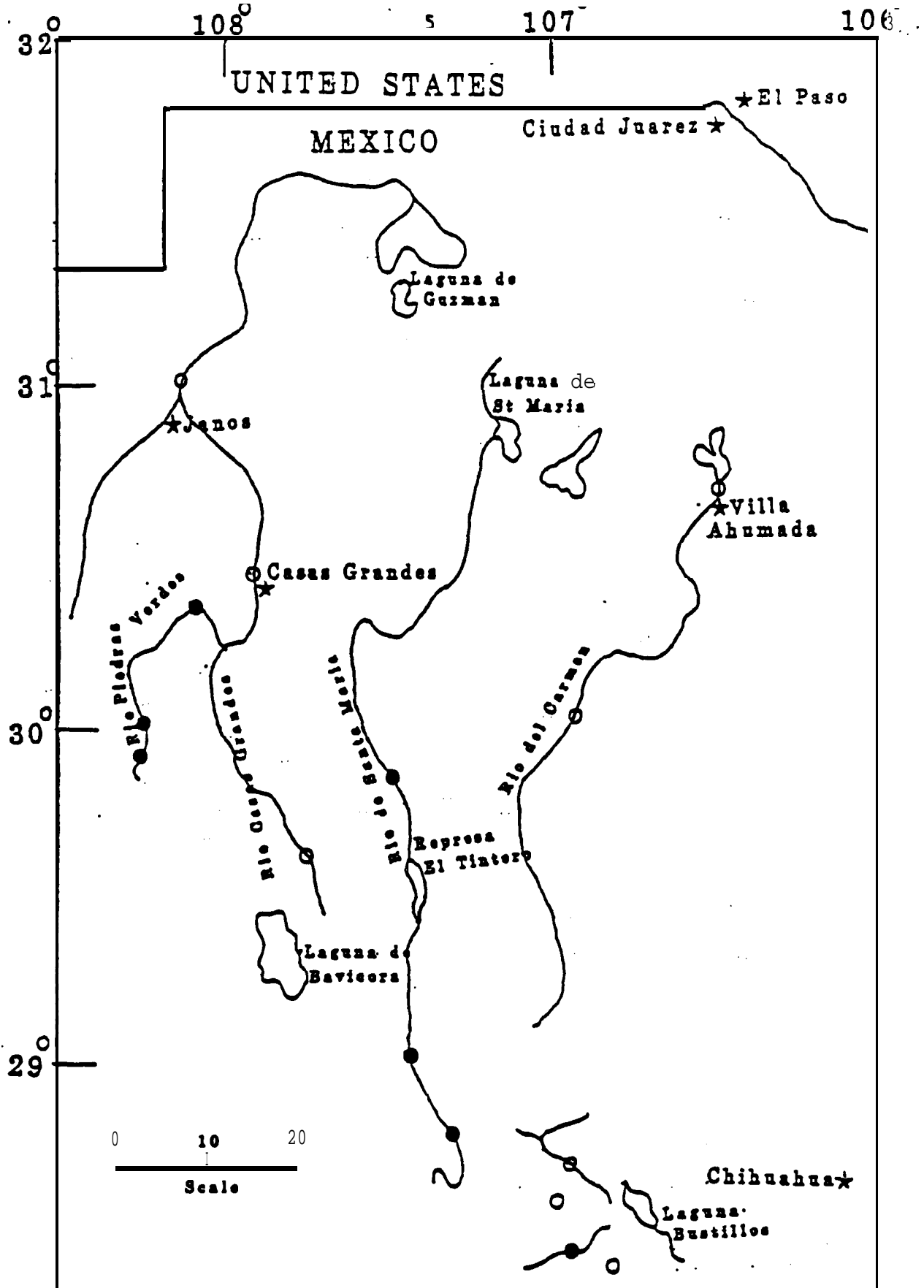


Figure 2 - Present distribution of the Chihuahua Chub in Mexico. Solid circles represent distribution as of 1979, open circles represent sites occupied prior to 1979.

Biology

The Chihuahua chub **is** dependent upon habitat comprised of deep pools with undercut banks or over-hanging vegetation. This habitat type provides both escape **cover** and a suitable foraging situation. Chubs are rather trout-like in much of their feeding, taking terrestrial insects on the surface as well as aquatic invertebrates and perhaps **some** fish and vegetation. Chihuahua chubs spawn in the Mimbres River in late **April** and May. Spawning **is** believed to take place in quiet pools approximately 3 to 7 feet in depth over matted beds **of** aquatic vegetation. At Dexter National Fish Hatchery highest reproductive success was achieved **in** ponds where gravel beds were provided.

Presently, six species **of native** fishes are known to inhabit the waters of the **Guzman** Basin: the Chihuahua chub, Rio Grande mountain sucker (Catostomus plebeus), fathead minnow (**Pimephales promelas**), beautiful shiner (Notropis formosus), Mexican stoneroller (Camptostoma ornatum), and an **undescribed** pupfish (Cyprinodon sp.). Except for the pupfish, these species are usually found in association with G. nigriscens. However, in the **Mimbres** drainage of New Mexico; the Mexican stoneroller was apparently never present, and the beautiful shiner has been extirpated. Exotic species which have been reported occurring with G. nigriscens in Mexico include the carp (Cyprinus carpio) and black bullhead (Ictalurus melas) (Robert Miller pers. comm.), rainbow trout (Salmo gairdneri) and **longfin dace** (Agosia

chrysogaster). Two additional **exotic** species, the speckled **dace** (Rhinichthys osculus) and the **Gila** trout (Salmo gilae) occur in the Mimbres drainage in New Mexico, but neither occurs with the chub.

Oldtimers in the **Mimbres** Valley angled for the Chihuahua- chub, which was locally known as "Gila trout". It is likely that the ancient Mimbres Indians took Chihuahua chubs as food, as their pottery depicts fish that resemble the species. In fact, judging from pottery motifs, it **would** appear that the Mimbres River once supported a notably greater diversity of species, including 'catfish (Ictalurus) and gar (Lepisosteus). This would have been seven or more centuries ago, when the **river was** more stable.

According to a report by Emory (1848), **fish identified** as trout (Salmo sp.) historically occupied the Mimbres River, New Mexico and presumably coexisted with the chub there and in other waters of the Guzman Basin. Unfortunately, the validity of this record is uncertain, as Emory did not obtain any **specimens**, and no native **salmonid** has ever been taken in any water of the Guzman Basin. However, Dr. Robert Miller of the University of Michigan, has studied the fishes of the **Guzman** Basin **extensively** and feels that Emory's report is reliable. Furthermore, he suspects that a native salmonid **may** exist or have existed in the **Guzman** Basin in Mexico.

Conservation

Annually New Mexico Department of Game and Fish biologists have been monitoring the distribution and abundance of the Chihuahua chub in the Mimbres River since **its** rediscovery there in 1975. The survey **is** done by using selns and backpack electroshockers. The **U.S.** population of the Chihuahua chub is generally restricted to the Mimbres River between **Allie** Canyon and the Mimbres Post Office. Within **this** area, the specific areas occupied by the species have changed **with** the variation of flow regimes, particularly flood events. Until late 1978, **the** species was represented by no more than **30-40** adult fish. The severe flooding of late 1978 and early 1979 displaced **some** chubs downstream, and these individuals were lost from the population. Subsequent inventories have revealed that the population of chubs presently consists of no more than 150 adults.

Because of the extremely low population number, and the destructive post-flood reclamation work on the river, **10** chubs were placed in Dexter National Fish Hatchery on-March 17, **1979.** These fish have reproduced successfully and it is hoped that they will preserve the gene pool and provide fish for future transplants into the Mimbres River. Several Chihuahua chubs from a population in the Rio Pledras Verdea, Chihuahua, were also placed in Dexter National Fish Hatchery in 1979. Efforts will be made to study these fish to determine if they are genetically and morphologically the **same** as the Mimbres stock. This group of

chubs has also reproduced successfully at Dexter. Care has been taken to isolate the Mimbres stock from the Rio **Piedras** Verdes stock at Dexter, as it **is** not known if morphological or genetic differences exist between these fish.

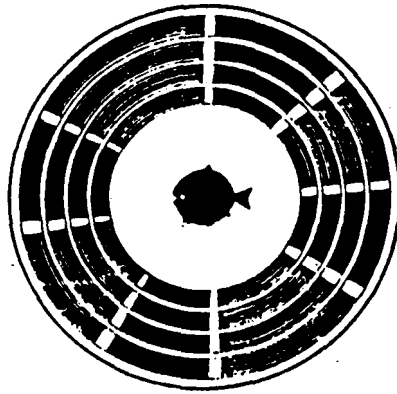
Reason for Decline

The decline of the Chihuahua chub in the **Mimbres** River appears to be primarily related to loss of habitat. This loss has been due to severe flooding caused by degradation of the watershed and **loss** of riparian vegetation, and to action taken by local landowners to protect their property from future flooding. The **Mimbres** River has been channelized and leveed by local landowners in an effort to confine flood waters. As a result, chub habitat has been destroyed. The work has not been effective or enduring, and must be repeated each spring at or near the time the chub spawns, making these activities especially detrimental.

That more and better habitat existed in the **past is** apparent from the accounts of **Antisell** (1856) and from the testimony of local residents. The former described the terminus of the river in the 1850's as being a series of pools or lagoons, surrounded by thickets of willows (*Salix* ssp.); for 4 to 6 miles above this point the river is said to have been up to 2 1/2 feet deep and to have flowed at 2 1/2 miles per hour in the summer. Today, the river terminus **is** usually dry. Diversions have reduced the quantity of water in the river, while uneven flows, flooding, and repeated stream **modifications** by local landowners have combined

to eliminate the conditions described by Antlsell (1856).

The introduction of exotic species such as rainbow trout (Salmo gairdneri) and longfin dace (Agosla chrysogaster) probably led to predation on and competition with the chub. However, these factors probably played a minor role in the declining status of the chub compared to the influence of loss of habitat.



PART II

RECOVERY

Step-down Outline

Prime Objective: To improve the status of the Chihuahua chub in New Mexico to the point that its survival is secured through viable populations **established and** maintained in the wild.

1. Maintain and enhance the existing chub population and its habitat in the **Mimbres** Valley.

11. **Monitor the** Chihuahua chub and its habitat.

12. Reclaim and perpetuate habitat essential to the Chihuahua chub.

121. Determine preferred **chub** habitat.

122. Provide flood protection which is consistent with the needs of the chub.

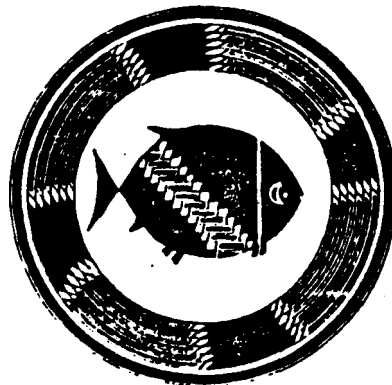
123. Recreate chub habitat.

124. Provide protection for and enhance existing habitat in the lateral spring-fed tributary and other suitable habitats.

13. Regulate human activities.

131. Ban the introduction of non-native fish into Chihuahua chub **habitat**.

132. Prohibit **taking** minnows for bait purposes.
133. Provide permanent Irrigation diversions which are consistent **with** the needs of the chub.
2. Hold and propagate the Chihuahua chub in a hatchery.
3. Determine the **genetic/taxonomic** relationship of U.S. and Mexican Chihuahua chubs.
4. Reestablish the Chihuahua chub within its former range in New Mexico where suitable habitat presently exists or can be created and maintained and monitor reintroductions.
5. Disseminate information about the Chihuahua chub.
51. Public information.
511. Local and State.
512. National and international.
513. International cooperation.
52. Professional **information.**



Narrative

Prime Objective: To improve the status of the **Chihuahua** chub in New Mexico to the point that survival is secured through viable populations established and maintained in the wild. Dellsting of the Chihuahua chub will be considered when (1) conservation easements or other legal agreements have been obtained on the spring-fed tributary where the **fish presently** exist, and (2) two additional secure populations are successfully established within its former range on the Mimbres River.

1. Maintain and enhance the existing chub population and its habitat in the Mimbres Valley.

Steps should be taken **to** maintain and enhance the existing Chihuahua chub population and its habitat.

11. Monitor the Chihuahua chub and its Habitat.

Chihuahua chub population(s) and habitat must be monitored on a long-term basis. The monitoring must focus on numbers, structure of the populations, and condition of the habitat. Should any of these or other factors suggest a decline in the population or degradation of the **habitat**, causative agents must be identified and remedied.

Any proposed activity within the **Mimbres** watershed which adversely affects the chub or its habitat must be stopped and replaced by **biologically** acceptable alternatives. Examples would include. introduction of exotic fish and activities in the areas of reclamation, road **construction**, grazing, logging, **cropland** Irrigation, and the use of chemical agents. Activities that **may negatively** affect the survival or maintenance of the chub population should be permitted only after being critically reviewed.

12. Reclaim and perpetuate habitat essential to the Chihuahua chub.

The natural stream configuration of **the Mimbres** River has been extensively altered due to severe flooding and **action** taken by local landowners to protect themselves from such events. The resultant straight, shallow, and levee-lined channel **is** not acceptable habitat for the chub. In order to restore habitat for the species, other provisions **will** have to be made to protect landowners property from flooding.

121. Determine preferred chub habitat.

Studies should be conducted in both the field and the laboratory to attempt to describe more exactly

the preferred habitat of the Chihuahua chub in relation to that which is available. Without this Information it may not be possible to undertake any long lasting habitat restoration.

122. Provide flood protection which is consistent with the needs of the chub.

Consult engineers on construction of levees which can provide adequate flood protection in the area without adversely affecting the chub or its habitat. Care should be taken to place the levees far enough away from the stream so that **non-**damaging flows are not unduly **constricted** or otherwise altered. Under these conditions, normal stream behavior will aid in restoring the **river** to something approaching its historic configuration of deep pools with undercut banks (ideal habitat for the chub).

Conventional levee construction in close proximity to the remaining **relict** chub population will have detrimental impacts by increasing flood flow **velocities** and further eroding the substrate. However, the development of a combined plan of flood protection and habitat enhancement for the chub **is** feasible. The initial elements of such a

plan have been pursued with technical assistance from the U.S. Army Corps of Engineers. Fill material used for levee construction should be from sites away from the stream to avoid disturbance to existing habitat. Debris **from** earlier flooding and from levee and **channelization** efforts should be removed. **On-site** work should be restricted to small earth moving equipment and hand labor. **Supervision** and **administration** of the actual construction should be shared by persons with biological and engineering expertise.

123. Recreate chub habitat.

Pools 3 **to** 7 feet in depth should be excavated adjacent to, and confluent with **the** main river **to** provide suitable habitat for the chub and to speed the habitat reclamation process. These pools should be situated in such a manner that they will be perpetuated by natural **stream** behavior. The excavated earth that accumulates during pool construction can be **used** in levee construction.

124. Provide protection for and enhance existing habitat in the lateral spring-fed tributary and other suitable habitats.

The lateral spring-fed tributary located on the east side of the Mimbres River opposite Bear Canyon Reservoir serves as a natural refuge for the species. Preservation of this habitat is essential if the species is to be maintained in the wild. Habitat protection must be sought by either the U.S. Fish and Wildlife Service or the New Mexico department of Game and Fish with the landowner(s) and preferably, in cooperation with The Nature Conservancy. In addition, the spring habitat can be enhanced by increasing the number and depth of pools. Pools 3 to 7 feet deep could

be created in the area by excavating and/or installing small log dams which could be negotiated by the fish. Such actions should be done carefully and in such a way as to avoid negative impacts on the chubs.

All streams within the Mimbres drainage have been surveyed and their suitability as restoration sites has been evaluated. Three areas (Fig. 3) have been identified in which to reintroduce the species: (1) the Mimbres River in the box canyon below the Cooney Place (T. 15 S., R. 11 W., Sec.

Landowner had to sell.

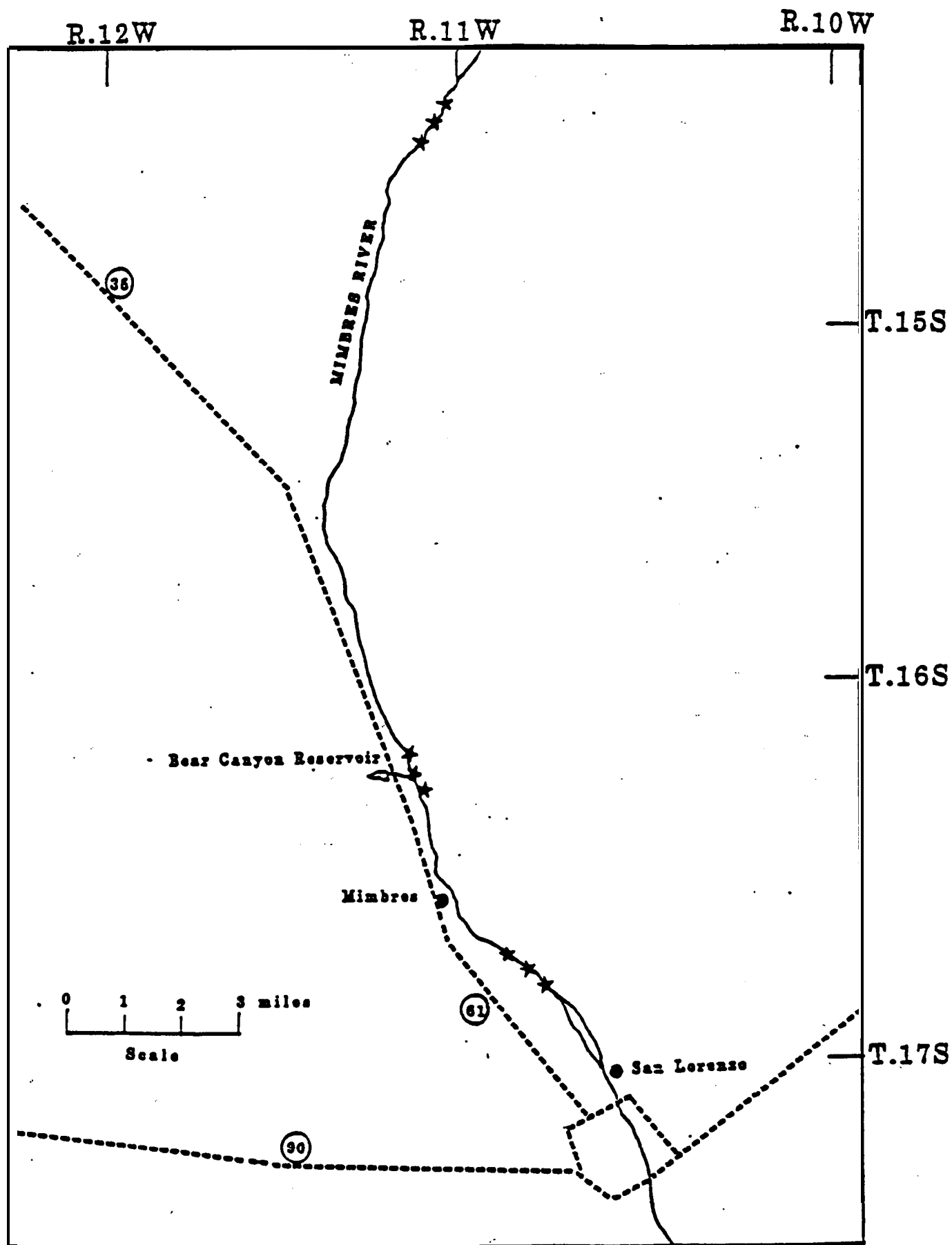


Figure 3 - * * * Chihuahua Chub restoration sites.

24, 35, 38, and '9); (2) the Mimbres River within the area (T. 16 S., R. 11 W. Sec. 20, 28, and 33); (3) the New Mexico Department of Game and Fish property about 3 miles upstream of San Lorenzo (T. 17 S., R. 11 W., Sec 10 and 11).

13. Regulate human activities.

Human activities in the proximity of Chihuahua chub habitat could adversely impact the species. When possible, these activities should be regulated to **minimize** such effects. These regulations should be posted **in** areas as appropriate.

131. Ban the **introduction** of non-native 'fish
into Chihuahua chub habitat.

It is important to prohibit **introduction** of exotic fish into the **Mimbres** River to prevent competition, predation, and/or hybridization. One means to this end is to prohibit the use of bait fish in any portion of **the Mimbres** drainage. Presently, the State of New Mexico prohibits the use of bait minnows in the Mimbres Drainage downstream to the highway 90 crossing, except in Bear Canyon Reservoir

where their **use is** legal (**N.M.G.F.** Regulation No. 595). **In** addition, planting of game fish, mosquitofish, bullfrogs, and other species by agencies must be closely regulated if not discontinued. Management of the fisheries in the upper **Mimbres** River and in Bear Canyon Reservoir must be made as compatible as possible with preservation of the Chihuahua chub and its habitat, and conflicts **must** be resolved in favor of the chub.

132. Prohibit taking minnows for bait purposes.

Identification of Chihuahua chubs, **particularly** young, **is difficult**. Therefore, to prevent inadvertent procurement of Chihuahua chubs for bait, the taking of any fish **for** this purpose **must be prohibited** in the Mimbres **drainage**. This **closure** should remain in effect indefinitely.

133. Provide permanent irrigation diversions which are consistent with the needs of the chub.

Legal agreements needs to be reached with

Local irrigators **concerning** construction and maintenance of irrigation diversions dams.

The annual establishment and constant maintenance of push-up irrigation diversions within the **Mimbres** River increase silt loads and otherwise disturb chub habitat. Long-term solutions to the diversion problem should be provided to help perpetuate the desired habitat of the chub. Therefore, permanent diversions that do not interfere with the **movements** of fish and that do not **dewater** downstream habitats should replace the **present** diversions within the **area** occupied by the chub. Once these permanent diversions are provided, local landowners would be expected to abstain from stream **modifications** for irrigation purposes.

2. Hold and propagate the Chihuahua chub in a hatchery.

The propagation stock at Dexter National Fish Hatchery should be maintained to provide offspring for stocking purposes and **to maintain a** reserve gene pool, should the natural population become extirpated. Production should be encouraged to provide for maximum numbers of fish for restocking. To maintain genetic integrity of the species,

the stock at Dexter NFH should be supplemented every two years with wild Chihuahua chub.

3. Determine genetic diversity

The genetic diversity between the United States and Mexican populations of Chihuahua chub should be determined.

4. Reestablish the Chihuahua chub within its former range in New Mexico, where suitable habitat presently exists
Or can be created and maintained and monitor reintroductions.

Reintroductions into high priority areas should proceed using stocks'available **from** propagation **efforts** at Dexter National Fish Hatchery. Other sites within the drainage of **Mimbres** River may be suitable **for** reintroductions and may be used if habitat improvements are made. These **sites** include **Gallina** and **McKnight** Creeks. Transplanted **stocks** should be monitored to document reproductive success and population parameters.

5. Disseminate Information about the Chihuahua chub.

Information concerning the Chihuahua chub should be disseminated **to provide** both understanding of the species and to promote support for the recovery effort.

51. Public information.

Besides providing basic Information on the species; a good public information program can encourage public support for expanding the Chihuahua chub in its historic range and increasing compliance with management programs.

511. Local and State.

Information should be disseminated to reach as large and varied a public audience as possible. **Media** to be used include newspapers, fishing proclamations, magazines, radia, and television.

512. National and international.

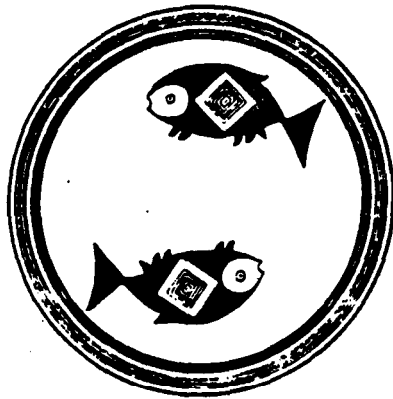
Information concerning the Chihuahua chub should also be supplied to media with national and international circulation.

513. International cooperation.

Encourage Mexico through diplomatic channels to give protection to their populations of chub.

52. Professional Information.

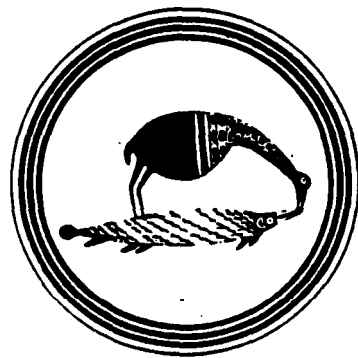
Technical information should be **made** available through **scientific** journals, agency reports, and regulations concerning the species.



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PART 111

IMPLEMENTATION SCHEDULE

Definition of Priorities

- Priority 1 - **Those actions** that are absolutely essential to prevent the extinction **of** the species **in** the foreseeable future.
- Priority 2 - Those actions necessary to maintain the species' current population status.
- Priority 3 - All other actions necessary to provide for full recovery **of** the species.

General Categories for Implementation Schedules

Information Gathering - I or R (research)

1. Population status .
2. Habitat status
3. Habitat requirements
4. **Management** techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. **Other** information

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other **management**

Other - O

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

PART III - IMPLEMENTATION SCHEDULE

| GENERAL CATEGORY (1) | PLAN TASK (2) | TASK # (3) | PRIORITY # (4) | TASK DURATION (5) | RESPONSIBLE AGENCY | | | FISCAL YEAR COSTS (EST.) * | | | COMMENTS (9) |
|----------------------------|--|---------------|-------------------|-------------------------|----------------------|-----------------|--------------|-------------------------------|--------|--------|---|
| | | | | | FWS REGION (6) | PROGRAM (6a) | OTHER (7) | FY-1 (8) | FY-2 | FY-3 | |
| I-1;2 | Monitor chubs and chub habitat | 11 | 2 | Ongoing | 2 | SE FR | NMG&F | 1,000 | 1,000 | 1,000 | |
| R-3 | Determine perferred chub habitat | 121 | 3 | 2 years | 2 | SE RE | NMG&F | 5,000 | 5,000 | | contract possible |
| M-3 | Provide flood protection consistent with habitat need for the chub | 122 | 2 | 3 years | 2 | SE | CE** | 1,000 | 1,000 | 1,000 | |
| M-3 | Recreate chub habitat | 123 | 3 | 2 years | 2 | SE | CE NMGLF | 10,000 | 10,000 | | |
| A-2 M-3 | Provide protection and enhance existing habitats | 124 | 1 | 3 years | 2 | SE | NMG&F | 50,000 | 30,000 | 10,000 | a priva group su as The Nature Conserva may take part |

* Costs refer to USFWS expenditures only
t New Mexico Department of Game and Fish
** Corps of Engineers

PART **III** - IMPLEMENTATION SCHEDULE

| GENERAL CATEGORY (1) | PLAN TASK (2) | TASK # (3) | PRIORITY # (4) | TASK DURATION (5) | RESPONSIBLE | | AGENCY OTHER (7) | FISCAL YEAR COSTS (EST.)* | | | COMMENTS (9) |
|----------------------------|--|---------------|-------------------|-------------------------|----------------------|-----------------|------------------------|------------------------------|-------|-------|---|
| | | | | | FWS REGION (6) | PROGRAM (6a) | | FY-1 (8) | FY-2 | FY-3 | |
| o-3 | Ban the introduction of non-native fish | 131 | 2 | Ongoing | 2 | SE LE | NMG&F | 1,000 | 1,000 | 1,000 | |
| o-2 | Prohibit taking minnows for bait | 132 | 2 | Ongoing | 2 | SE LE | NMG&F | 1,000 | 1,000 | 1,000 | |
| M-3 | Provide irrigation diversions which are consistent with chub needs | 133 | 3 | 2 years | 2 | SE | NMG&F CE | ? | ? | | cost dependent upon engineering study needs |
| M-1 | Hold and propagate chubs in a hatchery | 2 | 1-3 | Ongoing | 2 | SE FR | | 5,000 | 5,000 | 5,000 | |

* Costs refer to USFWS expenditures only
† New Mexico Department of Game and Fish
** Corps of Engineers

PART **III** - IMPLEMENTATION SCHEDULE

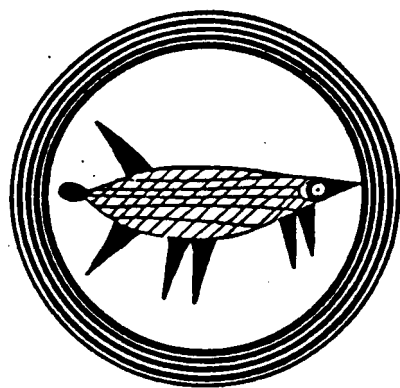
| GENERAL CATEGORY (1) | PLAN TASK (2) | TASK # (3) | PRIORITY # (4) | TASK DURATION. (5) | RESPONSIBLE AGENCY | | | FISCAL YEAR COSTS (EST.)* | | | COMMENTS (9) |
|----------------------------|---|---------------|-------------------|--------------------------|--------------------|-----------------|-------|------------------------------|-------|-------|---|
| | | | | | FWS | OTHER | | FY-1 (8) | FY-2 | FY-3 | |
| | | | | | REGION (6) | PROGRAM (6a) | (7) | | | | |
| R-5 | Determine genetic taxonomic relationships | 3 | 3 | 1 year | 2 | SE | | 5,000 | | | potential contract |
| M-2 | Reestablish and monitor the chub | 4 | 3 | 5 years | 2 | SE FR | NMG&F | 6,000 | 6,000 | 6,000 | |
| O-1 | Disseminate information | 5 | 3 | Ongoing | 2 | SE | | 5,000 | 500 | 500 | contract production of a pamphlet and video |

* Costs refer to USFWS expenditures only
 t New Mexico Department of Game and Fish
 ** Corps of Engineers

PART IV

'COMMENTS AND RESPONSES

Letters of comment on this plan have been reproduced in this section, followed by an outline of the responses made to each comment.





United States Department of the Interior

FISH AND WILDLIFE SERVICE

WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

In Reply Refer To:
FWS/OES

NOV 19 1985

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CI-11-115

Memorandum

To : Regional Director, Region 2 (ARD/AFF)
Acting Associate
From: Director

Subject: Review of the Chihuahua Chub Recovery Plan - Agency Draft

We have reviewed the subject plan and wish to commend your efforts on a well written draft. Editorial comments are provided in the margins of the draft (attached).

Specific comments are as follows:

- A-1 1. Page 3, third paragraph: Reference is made to the species being found in "at least 20 different streams." The map on page 5 fails to show all 20 locations.
- A-2 2. Page 4: The map is misleading in that the Mimbres River appears to enter Mexico. If possible, use a solid line leading into several dashes to indicate that the river terminus is dry.
- A-3 3. Page 6, first paragraph: Reference is made to annual stream channelization and levee construction. Please identify if the activities are Federal, State, or private actions. If any Federal actions are involved, e.g., funding or permits, Section 7 consultation must be conducted.
- Second paragraph: Describe the land ownership along the river. Who is responsible for the habitat?
- A-4 4. Page 7, Biology and page 9, Conservation: These sections fail to discuss the Mexican population of Gila nigrescens. Any information available, e.g., population numbers and threats, on the Mexican populations should be included.
- A-5 5. Page 9, Conservation, first paragraph: How is the Mimbres River population of Chihuahua chubs being monitored, e.g., annual, seasonal, method of survey? Again, who is responsible for the habitat?

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SE

Second paragraph: Reference is made to the Mexican (Rio Piedras) stock of Chihuahua chubs being propagated at Dexter National Fish Hatchery, but no mention is made as to the purpose of maintaining this **captive population**. Please discuss.

- A-6 6. Page 10, Prime Objectives: Incorporate the wording of the Recovery Criteria, page iii, in this section.
- A-7 7. Page 12, Prime Objectives: Same as above **comment 6**.
- A-8 8. Page 13, Task 121: Consideration **should** be given to simulating habitats on a small scale in a laboratory to study the "preferred" habitat.
- A-9 9. Page 18, Task 13: Regulate human activities: Restrictions listed under this task should be posted in areas as appropriate.
- A-10 10. Page 20, Task 2: Hold and propagate the Chihuahua chub in a hatchery. This task should contain a **subtask** to study the genetics of the Mexican populations of Chihuahua chub.
- A-11 11. **Page 22**: Add, 'Task 413. Encourage Mexican protection of their native **stock**,' to give special attention to the Mexican populations of chubs.

We hope these **comments** will be helpful in development of the final plan. If you disagree with any of the above **comments**, please let us know before the plan is put in final draft. Please provide the Office of Endangered Species, 500 Broyhill Building, 25 copies of the plan once it has been approved **and** printed.

Roman H. Koenig

Attachment

GOVERNOR
TONEY ANAYA
DIRECTOR AND SECRETARY
TO THE COMMISSION
HAROLD F. OLSON

State of New Mexico



DEPARTMENT OF GAME AND FISH

STATE CAPITOL
SANTA FE
87503

| | |
|-------------|-------------------------|
| 7 | STATE GAME COMMISSION |
| End So. R-2 | JAMES H. KOCH, CHAIRMAN |
| JOHNSON | SANTA FE |
| LENGOWSKI | GUTIERREZ, JR., M. D. |
| Bowman | CARLSBAD |
| Burton | JUSTINE DIGREGORIO |
| Carley | GALLUP |
| Holverson | THOMAS P. ARVAS, D. O. |
| Hoffman | ALBUQUERQUE |
| Lewis | JAKE ALCON |
| McDonald | ALBUQUERQUE |
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December 3, 1985

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CL-4

Michael Spear
Regional Director
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103 .

Dear Mike:

My staff has reviewed the draft recovery plan for the Chihuahua chub that has been prepared by the Office of **Endangered** Species, and we believe that it addresses the major considerations for bringing about the recovery of this species. Given our limited knowledge of this fish, and its requirements, I expect there will be some modification of the plan as more information is acquired. Specific comments on the draft are as follows:

- B-1 1). P. cl--locate **Allie** Canyon on the Mimbres River map.
- B-2 2). P. 4--provide a distance scale for the map.
- 3). P. S--provide a distance scale for the map.
- 4). P. 16--in addition to the two restoration locales recommended, the New Mexico Department of Game and Fish has acquired property on the Mimbres River (about 5 km above the village of San Lorenzo, **T17S R11W Sec 10 and 11**) that would serve as a suitable site for the establishment of another Chihuahua chub population. I believe this stream reach should also be included in the recovery plan recommendations.
- B-3
- 5). P. 26--Items 0-2 and 0-3 have costs of \$1,000 per year for 3 years. How will banning the introduction of bait minnows and prohibiting the taking of the same incur such costs?
- B-5

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DEC 6 '85

SE

Rec'd
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DEC 5 '85

RD

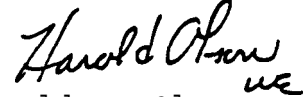
Michael Spear

-2-

December 3, 1985

Thank you for the opportunity to ~~comment~~ upon the Chihuahua
chub recovery plan.

Sincerely,

A handwritten signature in cursive script, appearing to read "Harold Olson", with a small flourish at the end.

Harold F. Olson,
Director

dlp



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Reply To: 2670

Date: NOV 26 1985

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Michael J. Spear, Regional Director
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Mr. Spear:

Thank you for the opportunity to **comment** on the Draft Chihuahua Chub Recovery Plan. Our **comments** will be directed only toward suggested activities that **may** potentially affect National Forest **System** lands and will not address other items in the recovery plan. We have provided informal **comments** to you previous to this **Agency** review draft, and those **comments** on the technical aspects of the **recovery plan** still **apply**.

The draft provides a logical starting point to begin addressing overall recovery of this species. The stated goals and recovery criteria are clear and concise and we **recommend** that they be carried over into the prime objectives of the **stepdown plan**.

C-1

There are, however, a number of unanswered questions concerning planned activities. For example, it appears from the **generalized** recovery needs listed on pages 12 and 13 that existing activities' (grazing, logging, road construction, etc.) within the **Mimbres** watershed could potentially be excluded without a thorough review of cause and effect relationships. We cannot agree to any plan that calls for, or **even** suggests, the complete cessation of major land uses and activities until these **uses** and activities have been demonstrated to have caused the decline of the species.

The Endangered Species Act directs us to carry out programs for the conservation of listed species and to ensure that our actions do not jeopardize the continued existence of any listed species. In determining causes of the decline of the species, each agency **must** use the best scientific data available. In the case of the Chihuahua chub, for which critical habitat was not declared, our **permitted** actions must be evaluated in terms of their effects on the species, and not in terms of their effects on the habitat. If any of our ongoing or proposed activities are found to be jeopardizing the species, we will work with you to determine ways of eliminating those detrimental effects.

FWS REG 2
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The draft plan addresses the need to **determine** preferred Chihuahua chub habitat, and we emphasize that this **must** be a primary step. Habitat information currently documented is only for adult chubs and then **only** for their cover requirements. Before Chihuahua chubs are placed into reclaimed habitat, or **modifications** are **made** in potential habitat, there must be a thorough analysis of the habitat requirements of the species, including velocity, substrate, depth, **cover** and **temperature** preferences for feeding and spawning sites, larval and juvenile life stages, and so forth.

NOV 27 '85

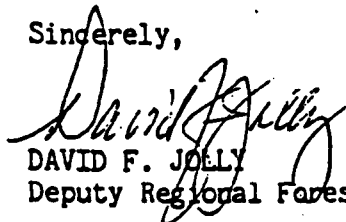
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We emphasize the need for detailed habitat information because we are reluctant to provide habitat that is marginal and will not sustain a viable population of fish, as has been the case for Gila trout in Sheep Corral Creek and headwater catfish in Sitting Bull Canyon Creek on the Lincoln National Forest. We strongly urge that the Recovery Team for the Chihuahua chub include a member who is conversant in fish habitat relationships, so that habitat requirements for the species can be fully addressed before on-the-ground commitments are made. 2

We appreciate the opportunity to review this draft and hope that our comments will aid in developing a usable planning document. The actions prescribed in recovery plans assume a high priority in our project planning and budgeting; therefore, we prefer to see them as specific as possible.

Sincerely,


DAVID F. JOLLY
Deputy Regional Forester





United States Department of the Interior

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN **REPLY**
REFER TO: LC-157B
565.

DEC 10 1985

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CL-12-12

Memorandum

To: Regional Director, Fish and Wildlife Service, P.O. Box 1306,
Albuquerque, New Mexico 87103

From: **FOR** Acting Regional Director

Subject: Agency Review Draft Recovery Plan for Chihuahua Chub (your
September 27, 1985, office memorandum)

We have reviewed the subject document as requested by your memorandum
September 27, 1985. Our **comments** are enclosed.

Should you require any clarification or further **information** regarding
comments please contact Tom Burke of our Environmental Office at
(702) 293-8464 or FTS-598-7464.

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| File Sp. R-2 | |
| JOHNSON | |
| Longmire | |
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| McDonnell | |
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Roy D. Lear

Enclosure

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DEC 13 '85

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Specific Comments

1. Distribution and Status (Page 3): The discussion and map (Figure 1) raise questions relative to Bear Canyon Reservoir. Is this a **mainstem** reservoir or off-river reservoir? If this is an off-river reservoir, do chubs occur in the discharge stream or tail-race area? How long is the discharge stream?
- D-1 Also, what is the river distance between **Allie** Canyon and Mimbres Post Office (miles or kilometers)? How long is the privately-owned spring creek? How long a reach of the Mimbres River was historically occupied by chubs (guess)? Regarding **the distribution** in Mexico, how many miles or kilometers of **stream** presently have chubs and what percentage is this of the historical distribution?
2. Figure 1 (Page 4): A number of additions to this figure would increase its usefulness:
 - i) Scale in miles or kilometers
 - ii) Demarcation of **Allie** Canyon
 - iii) Demarcation of private spring tributary
 - iv) Explanation of circled numerals
 - v) Demarcation of Grant County line
- D-2
3. Reasons for Decline (Pages 3-6): We suggest that this section **give** equal treatment to physical, chemical, and biological parameters of habitat. The top of page 6 attempts to credit physical changes in the habitat for the decline of chubs, while the bottom paragraph on page 6 suggest that biological changes (introductions of exotic fishes) had a minor role. Since no single factor can be decidedly pointed to for the decline, we suggest that all of these factors together are responsible.
- D-3
- This section of the report would be better understood if it was formatted to come after the discussion on biology and conservation. At a minimum, the historical habitat of the chub should be described first if loss of habitat is considered as a major cause for their decline. Logically, descriptions of both the **historical and** presently-utilized habitats should be presented and compared (both quantity and quality).
4. Biology (Page 7): It is inferred from discussions elsewhere in the text (last sentence, page 2; last sentence, paragraph 1, page 7; etc.) that some life history factors or observations have been made on young chubs. If this is true, these and other life history information should be included in this section.
- D-4
5. Terminology: A few words used in the text are very unusual, uncommon or misspelled. We attempted to locate two such words, **syntopically** (Page 7) and **exigencies** (page 9), in either a standard dictionary or a dictionary of scientific and technical terms. We were unsuccessful in both cases. If these words are not misspelled, we suggest a more common word or phrase be used in such cases so that the report is more readily understood by the general public.
- D-5

- D-6 6: Conservation (Page 9): The first paragraph suggests that the severe flooding between late 1978 and early 1979 had a very positive impact to the chubs, resulting in a ~~three-~~ to four-fold increase in adult fish. **This** contradicts statements given on page 6 regarding the effects of flooding.
- D-7 7. Prime objective (Page 10) : Change "and" in third line to and/or, as relict ~~populations exist~~ and more may be found.
- D-8 8. Recovery Plan Narrative: We agree **with** the statement made on page 13, section 121, regarding chub habitat. It appears from the bulk of the information provided that the existing habitat in the Mimbres River is unsuitable for chub. The main question therefore, is why are chubs existing there?



41
DEPARTMENT OF THE ARMY
 ALBUQUERQUE DISTRICT CORPS OF ENGINEERS
 P O. BOX 1580
 ALBUQUERQUE, NEW MEXICO 87103-1580

REPLY TO
 ATTENTION OF:

December 23, 1985

Engineering and Planning Division
 Planning Branch

Mr. Michael J. Spear
 Regional Director, Region 2
 United States Fish and Wildlife Service
 P.O. Box 1306
 Albuquerque, New Mexico 87103

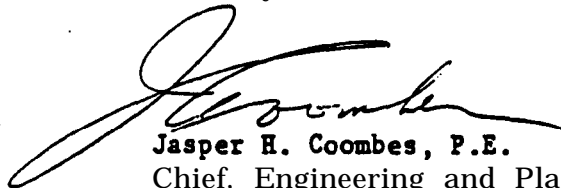
Dear Mr. Spear: .

Thank you for the opportunity to review and comment on the Draft Recovery Plan for the Chihuahua Chub. The Corps of Engineers can, as part of its responsibilities for flood control, administration of Section 404 of the Clean Water Act, and planning assistance to other agencies, incorporate and recommend measures that can contribute to the conservation and enhancement of the Chihuahua Chub and its habitat. There are measures that can concurrently contribute to the integrity and protection of certain flood control features and benefit aquatic and riparian resources. Also, there are other simple measures that can be accomplished during any construction activities that can improve aquatic habitat.

E-1 The first item on the last page of the Implementation Schedule should be modified, since the Corps of Engineers is not authorized to provide or repair irrigation diversions. However, the Corps can provide flood protection for existing irrigation structures, if justified, and provide technical assistance in their design.

Your coordination of the Recovery Plan is appreciated, and we will continue to provide planning assistance.

Sincerely ,


 Jasper H. Coombes, P.E.
 Chief, Engineering and Planning Division

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 REGIONAL DIRECTOR

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
Post Office and Federal Building
P.O. Box 1449
Santa Fe, New Mexico 87504-1449

OCT 24 1985

Memorandum

To: Regional Director, Region 2, FWS, Albuquerque, NM

From: Deputy State Director, Lands and Renewable Resources, BLM,
Santa Fe, NM

Subject: Agency Review Draft Recovery Plan for the Chihuahua Chub

After reviewing the subject draft, we would like to provide the following
comments and questions:

- F-1 1. A more comprehensive description of this species habitat/location is needed.
This description should at a minimum include, land ownership status and mineral
estate status.
- F-2 2. Has water quality been analyzed in the section of the **Mimbres** River
identified on Figure 1?
- F-3 3. **Are upstream mining/mineral** operations being conducted on this river
drainage? Have they been conducted in past years?

Thank you for the opportunity to review this document.

David T. Jones

IN REPLY REFER TO:

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OCT 28 '85

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United States
Department of
Agriculture

Soil
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43 517 Gold Avenue SW, Room 3301
Albuquerque, NM
87102

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C-10230

October 21, 1985

Mr. Mike Spears
Asst. Regional Director
Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Mike:

SCS has reviewed the September 27, 1985, "Agency Review Draft of the Recovery Plan for the Chihuahua Chub." It is noted that the plan is based upon the 1980 management plan written by the New Mexico Department of Game and Fish.

Our principle interests are in the proposals outlined to accomplish the actual recovery, which are presented on pages 12 through 20.

On page 12, 1-11 the second paragraph states that activities including grazing, logging, cropland irrigation, the use of chemical agents must be critically *reviewed* to determine any negative affect on the survival or maintenance, of the chub population. Since these types of activities are a normal, continuing part of agricultural enterprises in the valley and its tributary watershed, we suggest that further elaboration on how the critical review will be conducted is in order.

On page 19, 133 a rationale is presented whereby local landowners having irrigation rights will be assisted in the construction of acceptably designed permanent diversion dams. We suggest that this statement will elicit considerable local interest. The final plan should provide more explicit details as to how the legal agreements, as well as engineering and financial assistance, are to be provided to the landowners.

As originally stated in our February 1991 letter regarding the establishment of critical habitat, SCS concurs that special design considerations can be mutually developed for diversion dams or flood reclamation activities. We do feel that these special considerations will result in increased costs to the landowners.

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OCT 24 '85

SE



The Soil Conservation Service
is an agency of the
Department of Agriculture

Mr. Mike Spears

- G-3 The final plan should clearly state what financial arrangements are to be made available to landowners who agree to modify their normal activities in the effort to benefit the chub.

Sincerely,



Ray T. Margo, Jr.
State Conservationist

cc:

Harold Olson, Director, Game & Fish Division, Villagra Building, Santa Fe,
NM 87501

RESPONSES AND REPLIES

- A-1 Paragraph was corrected.
- A-2 Map was changed as recommended.
- A-3 Paragraph was changed to include **identification** of agencies involved in the stream work. The second paragraph on Page 3 was changed to incorporate a **description** of Land ownership along the river, mainly private.
- A-4 Little or no recent information is available on the Mexican chub **population other than** general, information relating to continued destruction of habitat. Mexico is not a CITIES nation, has few resources to expend **on** the conservation of native fish species, and has **shown no** interest in participating in native fish conservation efforts with the U.S., thus no effort is **made in** the recovery plan to, include Mexico.
- A-5 The "Conservation" section was changed as suggested. Habitat management **responsibility** rest with private landowners and the **New** Mexico Department of Game and Fish. A sentence was added discussing the purpose of maintaining captive stock at Dexter **NFH**.
- A-6 Suggested change made.
- A-7 Suggested change **made**.
- A-8 Task 121 changed to **include consideration** of Laho'ratory studies.
- A-9 Suggested addition added to the recovery plan.
- A-10 Plan changed **to** include the suggested **subtask**.
- A-11 Suggested addition included.
- B-1 Map changed to include **Allie** Canyon.
- B-2 Distance scale for maps added.
- B-3 The recovery plan and **Fig. 3** have been changed to include the **NMG&F** property above San Lorenzo as a potential reintroduction site.
- B-4 The estimated cost are those expected to be incurred by the USFWS Law Enforcement Division in conducting Federal investigations of **illegal bait** fish introductions.
- C-1 The activities which are referenced on pages 12 and 13 are those which would be subject to the Section 7 consultation process. These **activities** would not be stopped, but if it

is determined, they could affect a listed species, prudent and reasonable alternatives would be developed.

- .c-2 The Desert Fishes Recovery team will be responsible for advising the Fish and **Wildlife Service** on implementing the recovery plan. This team contains several members who are extremely knowledgeable concerning fish habitat requirements.
- D-1 Bear Canyon Reservoir is an off-river re-servoir as shown on Figure 1. The chub does not occur in the tail-race or the stream below Bear Canyon **Reservoir**. The addition of a distance scale on Figure 1 gives an approximate idea of the length of stream below Bear Canyon Dam.
- D-2 **Figure 1** was changed accordingly.
- D-3 The recovery plan addresses all factors believed to be responsible for the **decline of the chub**. One of the tasks, identified in the step-down portion of the plan, **is** to gather information on the physical, biological, and chemical parameters **of** the habitat (Task 121). As suggested the Reasons for Decline section was moved to the end of Part I. Very **little** information **exist** on the historically occupied habitat, therefore, comparisons are not possible.
- D-4 All the information of life history, gained from culturing the species **at** Dexter *NFR*, is included in the recovery plan.
- D-5 The text was changed as suggested.
- D-6 The severe flooding referred to had a negative impact on the chubs because of the channelization of the river which followed the flooding. The population **estimation** includes the fish found in the springfed tributary opposite Bear Canyon Reservoir. The number 8 referred to as being negatively affected by flooding only considered the fish in the river.
- D-7 Changed as suggested.
- D-8 The bulk of the **population** does not exist in the Mimbres River, but is found in a small, springfed tributary as **described** on page 3 of the recovery plan. It is suspected that this is the source of fish which are found in the river.
- E-1 Changed as suggested.
- F-1 A sentence was added to the second paragraph on page 3.
- F-2 **Pee**, the USGS operates a **gauge** 08477110 at the town of Mimbres and has collected water quality information and flow information.

F-3 To the best of our knowledge, no upstream mining/mineral operations are being conducted or have been conducted.

G-1 The paragraph was changed to include mention of the Section 7 consultation process,

G-2 Sentence added to the first paragraph of Task 1.33.

G-3 The financial arrangements which can be made available to local Landowners cannot be determined at this time.

